

## CLAIMS

1. An ultrasonic diagnostic system, comprising:

5       electroacoustic conversion means in which a plurality of sub-arrays,  
each composed of a plurality of electroacoustic transducers, are arranged at  
least two-dimensionally;

10       a sub-beam former that is provided on the sub-array basis, generates  
signals having different polarities with respect to a received signal from the  
electroacoustic transducer in the sub-array, obtains a first signal and a  
second signal by controlling amplitudes of the signals having different  
polarities of each electroacoustic transducer in the sub-array, followed by  
adding, imparts a delay time difference corresponding to a quarter of one  
period of the received signal between the first signal and the second signal by  
delay means provided inside, and adds the first signal and the second signal  
15       to which the delay time difference is imparted; and

      a main beam former for subjecting a signal output from the sub-beam  
former to delay addition.

2. The ultrasonic diagnostic system according to claim 1, wherein the delay  
20       means is capable of switching the delay time difference between a quarter of  
one period of a fundamental of the received signal and a quarter of one period  
of a harmonic of the received signal.

3. The ultrasonic diagnostic system according to claim 1, wherein the delay  
25       means imparts a delay time corresponding to a quarter of one period of the  
received signal to one of the first signal and the second signal.

4. An ultrasonic diagnostic system, comprising:  
      electroacoustic conversion means in which a plurality of sub-arrays  
30       each composed of a plurality of electroacoustic transducers are arranged at

least two-dimensionally;

a sub-beam former that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, and obtains a first signal and a  
5 second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array, followed by adding, imparts a predetermined phase shift amount to one of the first signal and the second signal by phase shift means provided inside, and adds the first signal or the second signal to which the predetermined phase shift  
10 amount is imparted to each other; and

a main beam former for subjecting a signal output from the sub-beam former to delay addition.

5. The ultrasonic diagnostic system according to claim 4, wherein the phase  
15 shift means is composed of phase shift circuits in two stages, each having a phase shift amount of 45 degrees, and each of the phase shift circuits in two stages is configured so as to include a capacitor and a resistor.

6. An ultrasonic diagnostic system, comprising:  
20 electroacoustic conversion means in which a plurality of sub-arrays each composed of a plurality of electroacoustic transducers are arranged at least two-dimensionally;

parallel adding means that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal  
25 from the electroacoustic transducer in the sub-array, and obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array, followed by adding;

a first main beam former for subjecting a first signal added by the  
30 parallel adding means to delay addition;

a second main beam former for subjecting a second signal added by the parallel adding means to delay addition;

delay means for imparting a delay time difference corresponding to a quarter of one period of the received signal between an output signal of the first main beam former and an output signal of the second main beam former;  
5 and

adding means for adding an output signal of the first main beam former and an output signal of the second main beam former, to which the delay time difference is imparted by the delay means.

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7. An ultrasonic diagnostic system, comprising:

electroacoustic conversion means in which a plurality of sub-arrays each composed of a plurality of electroacoustic transducers are arranged at least two-dimensionally;

15 parallel adding means that is provided on the sub-array basis, generates signals having different polarities with respect to a received signal from the electroacoustic transducer in the sub-array, and obtains a first signal and a second signal by controlling amplitudes of the signals having different polarities of each electroacoustic transducer in the sub-array,  
20 followed by adding;

a first main beam former for subjecting a first signal added by the parallel adding means to delay addition;

a second main beam former for subjecting a second signal added by the parallel adding means to delay addition;

25 phase shift means for imparting a phase difference of 90 degrees between an output signal of the first main beam former and an output signal of the second main beam former; and

adding means for adding an output signal of the first main beam former and an output signal of the second main beam former, to which the phase difference of 90 degrees is imparted by the phase shift means.  
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